Space Weather Forecast

Issued on Wednesday, 31 January 2024 at 01:02 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further R1/R2 Radio Blackouts. Possible glance from a coronal mass ejection and Chance of G1 Day 1 (31 Jan). Slight Chance of S1 Radiation Storms reoccurring should any significant flares occur.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is now Low, with a peak common-class flare peaking at 30/1739 UTC from the northwestern limb. There are currently five sunspot regions on the disc. A relatively new region in the northeast appears to have increased in complexity, however its proximity to the northeastern limb mean this analysis is currently low confidence. Other spots on the disc have shown some growth over the past 12 hours but have remained relatively simple and quiet.

No Earth-directed coronal mass ejections (CME) were evident in coronagraph imagery.

Solar Wind / Geomagnetic Activity: Solar winds, as measured by DSCOVR and ACE at L1 showed the likely influence from a fast wind, with the solar wind at slightly elevated to elevated levels. The interplanetary magnetic field (IMF) was weak throughout, varying between 2-6nT. The north-south component varied weakly. The net result of the above solar wind measures was Quiet geomagnetic activity (Kp 0-2).

Energetic Particles / Solar Radiation: High energy proton flux was above S1 radiation levels until 30/0425 UTC. This was in response to the Moderate flare on 29 Jan. The high energy proton flux has been on a gradual decline ever since but remains elevated compared to background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Chance of further Moderate class flares and a Slight Chance of isolated Strong class flares in the near term. This risk reducing somewhat as the large spot on the northwest limb further rotates around to the far side of the Sun.

Solar Wind / Geomagnetic Activity: Generally Quiet to Unsettled conditions expected in association with a fast wind initially, with a peak of likely Active intervals and a chance of G1 Minor Geomagnetic Storms on Day 1 (31 Jan) in association with the expected shock arrival from the 29/0438 UTC coronal mass ejection. Further Active intervals likely towards the end of the period in association with the next fast wind influence.

Energetic Particles / Solar Radiation: High energy proton flux is expected to remain below the S1 Radiation Storm level, with only a slight chance of going above, should any significant flares occur on Day 1 (31 Jan). This risk reduces through the period back in line with raw probabilities.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	5	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	35	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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